

Q'E'YMINN HE

*The Watershed Wrap is now the q'e'yminn he 'ulhnsikwe'n. The translation in the Coeur d'Alene language is, "about the Watershed". The term for watershed means literally everything belonging to the watershed: the water, people, plants, fish, wildlife, cultural uses and air, as well as the impact of our activities!

'ULHNSIKWE'N WATERSHED WRAP

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*Semi-annual newsletter from the Coeur d'Alene Tribe's Natural Resources programs describing watershed management efforts.
Offering readers food for conversation and paper for wrapping.*

Lucky Angler nets \$1000 payout for pike caught near Rocky point

Plummer, Idaho – Mark Matherly, a 41 year old resident of Fairfield Washington, had recently planned a relaxing afternoon of fishing with his two sons, 9 year old Joseph and 14 year old Jesse. June 25th found the family, poles in hand, on the dock at Rocky Point in Heyburn State Park. They arrived with only the expectation of having some fun, but left with a big surprise and a fish tale worth sharing.

Soon after Joseph had dropped his line in the water, which was rigged with a simple #8 hook, worm, and bobber, a large pike struck at his bait and entangled itself in the rigging. As it was being reeled in, it made one good thrash and broke Joseph's line. But the story doesn't end there. In its attempt to escape, the fish swam too close to Mark's line and the hook on Mark's rigging snagged on Joseph's broken leader that was still wrapped around the fish. The pike's escape was foiled and was landed shortly thereafter on the dock. Mark and his sons had no reason to suspect that the pike they landed was anything more than an adrenaline rush and a good story. But – wait for it – the story doesn't end there.

Another angler that had watched the excitement from the boat launch congratulated the father and son trio and encouraged them to turn the pike in at the check station the Coeur d'Alene Tribe set up at the Heyburn State Park headquarters as part of a Northern Pike Reward Program.

The Program was initiated on October 1, 2015 by the Tribe as a way to encourage the public to help collect

data on the abundance and movement patterns of pike in the shallow, southern end of Coeur d'Alene Lake. The data is being used to formulate more effective management strategies focused on recovering native cutthroat trout, a preferred prey item of pike.

Northern pike, a non-native fish that was illegally introduced to Coeur d'Alene Lake in the early 1970's, can consume large quantities of fish and can substantially impact other species, especially native trout populations that are the focus of conservation efforts.

Anglers who participate in the program receive \$5 for each fish turned in, with the possibility of receiving a larger payout if they catch a tagged fish.

Turns out that the Matherly's pike had been tagged by the Coeur d'Alene Tribe Fisheries Program last October and was worth \$1000! When asked what they planned to do with the money, Mark stated that he intended to share the reward with his two sons who have been asking for new bicycles. Mark explained that he is not a pike fisherman and just went out for the afternoon to throw in a line to see what they could catch. The Matherly's are proof you don't need a fancy boat or expensive equipment to participate in this program. A pole and some good old fashioned luck are sometimes just good enough.

With another \$1000 reward fish still likely out there, and numerous others worth \$50, \$100, and \$500, the Tribe encourages anglers to keep trying their luck.

We suggest turning in all the pike that are caught because you won't be able to identify which fish have additional incentive payments just by looking at them. Small tags, not visible to the angler, have been implanted into the heads of a select number of pike. In the fall of 2015, 70 pike received these tags and were assigned dollar values anywhere from \$50 to \$500. More pike were tagged in the fall of 2016 to make the reward program more inviting, with 60 fish receiving \$50 tags, 25 receiving \$100 tags, 8 receiving \$500 tags, and two fish each receiving a \$1000 tag. Based on estimates of how many pike are in the southern end of the lake, the odds of catching one of these tagged pike would be around 1 in 15. Not bad odds for spending some time fishing on the lake. The payouts for pike turned in as part of the program have now reached a total of \$6,620 as of October.

To be eligible for the reward program, anglers are required to have a valid tribal fishing license, which can be purchased at the Tribe's Fisheries Program office and at various vendors in the area. The harvested pike need to be deposited in a freezer that is housed at a check station at Heyburn State Park headquarters at 57 Chatcolet Road. Materials for depositing the pike are available at the check station, which include bags for the pike and angler report cards that need to be filled out completely and included with the fish. Typically, the freezer is checked at least once a week, and reward monies from processed pike mailed out to anglers soon thereafter. Additional information on the program is posted at the check station, as well as at the three boat launches that are located in Heyburn State Park. Any questions can be answered by calling the Coeur d'Alene Tribe Fisheries Program at (208) 686-5302.



Mark Matherly holds the \$1,000 check he received for the reward fish turned in on June 25th.



Photo of the \$1,000 reward fish caught by Mark Matherly of Fairfield, WA. Photo credit: Jesse Matherly



Intertribal Natural Resources Youth Camp

By Gina Baughn, Natural Resources Education Specialist

Earlier this year the Coeur d'Alene Tribe played host to the annual Inter-tribal Natural Resources Youth camp. This camp is a long standing collaboration between the Forest Service and the Nez Perce, Kootenai, Coeur d'Alene, Kalispell and Spokane tribes. Each year youth from these communities are invited to a neighboring reservation for a week long camp that highlights the work being done within each tribe's usual and accustomed territories.

This year the camp was held from June 19th – June 23rd, with youth and invited family members spending the first two days of camp at Marble Creek campground on a tributary of the St. Joe River. Instead of using tents campers were tasked with the challenge of setting up their own tepees to camp and sleep in. Although it was challenging, the youth were left with a feeling of accomplishment as they hoisted the poles into the air and learned which directions to place the tips of the poles in order to ensure the greatest stability. Campers explored the Hobo cedar grove to learn about the traditional use of the plants growing in that area, including how they were used as foods and medicines.

On the third day, youth broke camp and moved down to Benewah Lake for the remainder of the week. There they had another chance to perfect their tepee raising skills. Once settled, campers enjoyed listening to traditional stories such as, "Coyote and the green spot", while actually being within view of the green field from which the story takes its name. The camper's days were mixed with science and fun as they were able to swim,

canoe, paddle board, and hike throughout the week and participate in activities such as water quality testing on Coeur d'Alene Lake.

Toward the end of the week, youth were bused to the 9-mile bridge in the Benewah Creek watershed to take a walking tour of a tribal restoration area. There they were able to assist in constructing manmade beaver dams to improve stream habitat and to help net fish during an electroshocking survey. They also got an anatomy lesson while watching a fish dissection.

On their last day at Benewah campground, campers hiked the cedar loop trail and after a steep trek up the mountain side were rewarded with a beautiful and expansive bird's eye view of the lake. The week long adventure culminated in a fun-filled floating trip down the Spokane River with lots of splashing to go around. The day of floating ended with a barbeque in beautiful Plante's Ferry Park.

For more information about participating in this or other events go to our Facebook page and hit the like button! www.facebook.com/cdatrife.fishandwildlife



A formula for trout habitat

By Gerald I. Green, Wildlife Biologist

Within the professions that focus on ecological restoration, there seems to be two primary approaches to improving habitats with the goal of supporting native wildlife and fish populations. Those approaches can be called *form restoration* and *process restoration*, respectively. When applying form restoration to reviving streams, for example, the restoration practitioner hopes to know enough about how water flows across a certain landscape to design the correct number or meanders, the correct ratio of pools to riffles, the correct interaction between stream and floodplain and establish the correct rates of sediment transport and deposit. Essentially the practitioner would

make a disturbed stream or river look like a more natural stream or river and assume (or hope) the native fish and wildlife populations would find the constructed habitats suitable. Form restoration is sort of a “build it and they will come” approach.

On the other hand, process restoration focuses on assisting natural processes and accelerating the timeframes wherein these processes can produce the desired fish and wildlife habitat. Further, process restoration can concentrate on one or more key functions in order to change the configuration of the whole. This may seem more haphazard or less focused than form restoration, but it also requires a good understanding of habitat interactions in order to identify the correct process to assist. But ultimately, it relies on the process to produce the end product.

In the case of the entrenched Hangman Creek channel, we first completed an assessment of restoration options using the form restoration approach back in 2008. Hangman was straightened from its original course, eroded its bed and banks, and became deeply entrenched over time; severe erosion is a legacy that continues to be a significant concern. The restoration recommendations included using heavy equipment to raise the stream channel to its original elevation and add the needed meanders, or we could pull the banks back to create a floodplain large enough to accommodate winter high flows at the lower entrenched elevation. Either option could cost up to \$2,000,000/mile to construct, and there are a lot of miles in Hangman and its tributaries that need treatment. For a number of reasons, including cost, we therefore chose to use this approach in only limited areas where the benefits were obvious and far reaching.

With encouragement and direction from tribal elder Felix Aripa, and a review of other successful restoration projects, we settled on assisting the *hnmulshench* (beaver) in its life ways as a way of implementing process restoration on a broad scale. We found that despite all the technical jargon that has developed around restoration and restoration ecology, with the beaver we could talk about our efforts in a very straight forward way. The following formula captures the central idea of what we do:

$$\text{Stream} + \text{Aspen} + \text{Beaver} = \text{Trout and Salmon}$$

On a landscape management level, we simply improve on weaknesses that we find on the left side of the above equation, and if our improvements are sufficient, the fishery implied on the right side will flourish.

Of course there are specifics that are hidden in the equation. For instance, it's not beaver per se that contributes to improvements in trout habitats: beaver dams create the benefits. Beaver dams create the pools, which cool stream flows and store water for the dry season. And while aspen bark may provide the beaver's preferred food, beaver will forage on the bark of a whole

family of trees, which also includes willows, poplars and cottonwoods. Beaver can also use choke cherry trees, service berry trees, hawthorns, and even pine in some circumstances. And the term “stream” implies perennial water flow, even if it requires beaver to hold enough water on the landscape to provide that flow.

The Wildlife Program is trying to assist the whole interaction between floodplain/riparian zone forest, beaver and stream to accomplish the long term goal of securing the landscape to provide for a native fishery.

To improve the supply of native shrubs and trees, fields taken out of agriculture must first be planted and established with native grasses in order to prevent noxious weeds from degrading everything. In the spring of 2017, the Wildlife Program staff planted native grasses on 45 acres of floodplain/riparian habitat that was formerly used for agriculture production. Once the grass is well established in those 45 acres, we will plant the shrubs and trees that beaver favor. Because of limited funding, planting of native grasses occurs every third year, so the next round of grass planting will occur in 2020.

Plantings of native tree and shrubs favored by beaver are completed in both the spring and fall. Because we were occupied with grass planting, shrub and tree planting was rather limited earlier this spring, with only 300 aspens planted along streams and drainage bottoms in project sites. As of the writing of this report, the Wildlife Program staff is working hard to put 1,577 native trees and shrubs in the ground before the rain and snow makes that work too difficult to accomplish.

In addition to the supply of deciduous trees and shrubs that are needed for beaver to construct dams, once those dams are built they need reinforcing to survive the extreme flows of the late winter/early spring. Beaver dams often don't persist from year to year in such high flows. So even if beaver had a good supply of food and building materials, the beaver won't make any lasting improvements to stream habitats with just more materials to build with. Recently, the Wildlife Program has started reinforcing beaver dams to ensure that they persist from year to year. During August of this year, Wildlife Program crews drove three hundred 3 inch wooden fence posts in 8 dams that were built by beaver within project sites. These wooden fence posts are driven through the dams and into the bed of the creek. This amount of effort reflects the value of each dam to the whole restoration process. We don't mind making the investment, given the benefits that beaver dams provide in the system.

We've settled into a bit of a routine with our annual efforts. During the fall the crews are always working hard to plant a large number of native deciduous trees and shrubs before the rains and snows come. Along with any tree and shrub plantings come the protection efforts to ensure most of those plantings are not killed by deer, elk, mice and/or beaver foraging. Once the trees

and shrubs are taller than head high, the protections are removed so the beaver can make use of the established woody material. During the spring, we always plan on planting at least a few aspen, but spring plantings rotate between a year of grass seeding and two years of deciduous tree and shrub planting in areas already established with native grass. In the late summer or early fall, we look for beaver dams that need a little help in withstanding high flows. Any beaver dam that looks vulnerable is reinforced with wooden fence posts. To date, providing building materials and structural reinforcement for beaver dams seems to be the best way we can assist the natural processes that will build the instream habitats that will provide a native trout fishery in Hangman Creek.



Sharp-tailed Grouse Habitat

By Gerald I. Green, Wildlife Biologist

The Coeur d'Alene Tribe's Wildlife Program recently completed an assessment of sk'waqhl'u' (sharp-tailed grouse) habitats within the Hangman Creek Watershed on the Reservation. The results to that assessment indicate that habitats are not sufficient to warrant seriously considering a reintroduction at this time.

Sk'waqhl'u' were once prominent within the Palouse. The bunched grasses and forbs were perfect for the grouse to hide their nests under and the spacing of the vegetation provided room for the chicks to forage while never straying far from cover. In the fall, after the chicks reached maturity, the birds moved into nearby shrub communities that lined most every drainage. Through the insect free cold months the birds foraged on the buds of birch, willow, aspen and hawthorn. The birds met all their needs by moving seasonally back and forth between the open bunch vegetation and dense shrubs.

The term prairie chicken was applied to both the sharp-tailed grouse and the sage grouse, although the sage grouse inhabited the drier sagebrush country of the central Columbia Basin. It is the communal dancing behavior on the spring leks that captures everyone's attention. This dancing is part of the mating ritual that occurs in early spring, after their winter stay in the shrub communities and before they move to the open grasslands. The Wildlife Program assessment focused on the winter shrub communities and the summer nesting/brood rearing habitats. We assume that if winter and nesting/brood rearing habitats are available, the birds will choose their lek locations according to their needs.

The Wildlife Program discovered that winter habitats are limited both in extent and quality. Within the

open grounds of the Hangman portion of the Reservation, only 1.6% of the potential sharp-tailed grouse habitat was identified as suitable winter shrub. We can add another 5% to that figure because, theoretically, sharp-tailed grouse can forage for grains within agricultural fields during the winter as a marginal substitute for the buds of shrubs. Together, these only total 6.6% of the open ground as suitable winter habitat. Furthermore, that 1.6% that is currently shrub communities along the drainages are dominated by Douglas hawthorn, which is not an optimum arrangement for sharp-tailed grouse. Grouse prefer a mix of shrub, and birch is preferred above the others.

Within the Study Area, former agricultural fields that were retired and enrolled in the Crop Reserve Program (CRP) make up what can be identified as open grassland nesting/brood rearing habitats. We discovered that these fields comprise only 14% of the potential sharp-tailed habitat. The fields are relatively small compared to the needs of sharp-tail and are populated by non-bunch grasses. Taken together, these findings indicate that improvements in nesting/brood rearing habitats will be needed for sharp-tailed grouse to persist within the Reservation.

In addition to the sparse cover and low quality of winter and summer habitats for sharp-tailed grouse, there is a problem with the distance between these habitats. Sharp-tailed grouse must move easily between the markedly different habitats. But we found that the CRP fields are clustered along the eastern and southeastern margins of the open ground that is potential habitat. The retired agricultural fields largely border the forest habitats east of Highway 95, where the potential for crop production is low relative to grounds west of Highway 95. By contrast, the winter shrub habitats are scattered along drainage bottoms that extend westward to the boundary of the Reservation. The distance between these two habitats averaged just over 1,000 yards. For a bird that is as vulnerable to predation as the sharp-tailed grouse that is a long way to travel while fully exposed.

Currently, this is where we leave the issue of sharp-tailed grouse on the Coeur d'Alene Reservation. Winter and summer habitats are limited in extent and quality, and these habitats are not close enough to each other for the grouse to move easily back and forth between them. However, this is not the final word. Restoration of habitats, particularly winter habitat, is occurring as part of efforts to restore the hydrology of the watersheds in preparation for the return of native fish. At this point, we are recommending that this question of whether or not habitats are suitable for sharp-tailed grouse on the Reservation be revisited in 10 years. Landscapes change as economies, human relations and weather changes; leaving some hope for sk'waqhl'u' for the future.

More Coeur d'Alene Reservation History

By Barbara Scaroni, Forester

In 1919, the Tribal forested land consisted only of those lands that remained in individual ownership as allotments. The remainder of the reservation had been thrown open to homesteading in 1909, and most of the forested area was no longer in Indian ownership. In 1919, a forestry report stated that Indian forest reserves consisted of 19,460 acres of allotted land. Standing timber was estimated at 59 million board feet of which 75 percent was ponderosa pine, 10 percent was western larch, 10 percent was fir, and 5 percent was other species. Of the Indian land containing timber, 90 percent was classified as agricultural land.

With the influx of homesteaders and white settlement within the Reservation borders, timber harvest changed from being primarily for local use in construction to large scale removal of trees for processing and shipping to remote destinations. Sawmills sprang up on the Reservation and in adjacent towns and cities. At least three sawmills operated near Tensed in 1919. Winter logging was preferred as logs could be hauled to loading spurs on sleighs at half the cost of trucking, but this method depended on unpredictable snowfall that did not always materialize. Lumber produced at Reservation sawmills was usually hauled by truck to Tekoa and put on rail cars and shipped to distant markets - some on the east coast. Potlatch Lumber Company also operated a retail lumber yard in Tekoa.

Since allotment timber was found in small scattered areas, conditions were not usually favorable for large efficient operators to purchase Indian sales. Small operators, sometimes known as gypo loggers, purchased many of these sales. These men were proficient at cutting and hauling logs, but did not always have a good business background or much operating capital. To make matters worse, new white homesteaders were busy clearing land to farm. Rather than looking at making a profit from the timber, they flooded the existing market with trees that they just wanted to be rid of. The combination of depressed prices and a lack of operating capital and marketing expertise made it difficult for these loggers to make a good living.

Forested lands within the Reservation that had been taken from Indian ownership through the Dawes Act were extensively logged by private companies. Chief Joseph Seltice wrote a letter to the Commissioner of Indian Affairs in 1935 to express his concerns stating "If this slaughter of timber is permitted to continue, it will be a matter of a very few years that a standing tree will be unseen on this Reservation." In the 1920s, a logging railroad was constructed from Tekoa through the Reservation along Hangman Creek to slightly east of



Sanders. At that point, a corduroy [wood plank] road climbed up and over to connect with another McGoldrick railroad coming from Emida. Evidence of this railroad, and the spurs constructed from it, can still be seen in some allotments and even in crop fields where the ground was not totally restored to its original condition when the tracks were removed in later years.

For many reasons, allotted forests remain and provide some of the only forest land seen today in Reservation valleys. Islands in seas of farm land, they provide important habitat for wildlife and act to slow soil loss and reduce rapid water exit from Reservation streams. Trees along these streams shade the water, so that someday, if agriculture installs filter strips and riparian plantings along farm field streams, fish habitat may return to Hangman Creek on the Reservation. Tribal forestry manages forest stands on allotments to both maintain productivity and growth and to allow periodic income to allotment owners. Fractionated ownership makes self-use by owners nearly impossible, but the land and valuable resources await the day when native Coeur d'Alene people again manage their own properties.



Tribe wins a second EPA grant to restore riparian habitat on Hangman Creek

By Bruce Kinkead, Fisheries Biologist

The Environmental Protection Agency awarded the Coeur d'Alene Tribe \$87,000 in October 2017 for a large scale riparian restoration plan covering a third phase of the Hangman Creek fisheries restoration project known as **k'wne'ulchiyark'wmntsut** (it will make itself crooked again). This grant was co-written and administered by the Fisheries and Water Resources programs. The grant program is administered at EPA through their Clean Water Act, non-point source pollution reduction program that focuses on decrease erosion and input of fine sediments into streams. This recent award follows on the heels of several other successful grant applications - an EPA grant in 2015, and grants from Trout Unlimited and the Western Native Trout Initiative which provided funds for the project over the last two years.

Allocation of funds will cover labor, plant materials, and plant protection cones and fencing. A full regime of riparian plants will be installed with the grant monies to provide bank stability, stream shading, and plants to support beaver food and dam building needs. Planting will begin this fall with 1,760 potted trees including a mix of black cottonwood, aspen, alder,

pacific willow, hawthorn and serviceberry. In addition to the plants, 6,000 feet of wildlife exclusion fencing was installed in September to protect the plants from browsing by elk and deer. Additional work is scheduled for spring and fall 2018. Lessons learned from previous riparian enhancement efforts will play a large role in plant selection at various locations.



New willow growth can be seen on Hangman Creek at the k'wne'ulchiyark'wmntsut project site.



New bridge at Bozard Creek is a crowning jewel for a blue ribbon fishery

By Stephanie Hallock, Habitat biologist

The Coeur d'Alene Tribe Fisheries Program recently completed a collaborative project with the Worley Highway District to replace an undersized culvert with a bridge in the upper Lake Creek watershed. The project was the largest of its kind for many of those involved and featured an innovative technology that made for a unique learning experience for everyone.

Bozard Creek, one of several tributaries that make up the headwaters of the Lake Creek watershed, was the deserving beneficiary of the project. The stream is an important spawning and rearing area for westslope cutthroat trout and boasts some of the highest densities of trout in the entire region. It is not unusual to see 80-100 trout per 300 feet of stream in some stretches. In a watershed that contributes as many as 8000 juvenile migrants annually to Coeur d'Alene Lake in recent years, Bozard Creek has the distinction of being the primary producer of the highly valued 16-22" trout that benefit from this intimate connection with the lake. In short: the stream is in a class by itself.

The problems with this crossing date back more than a generation. In most years during spring runoff, stream flow exceeds the capacity of the two 48" corrugated metal pipes laid side by side in a double barrel fashion in the channel. In each instance, sediment washes into the creek from the road, fouling habitat and

water quality and creating a maintenance headache for the Worley Highway District.



Damage from spring floods can be seen on the road surface at the Bozard Creek crossing earlier this year.

The solution comes with a fancy name that has been touted by the Federal Highway Administration as the “bridge of the future” and is notable for its simplicity in design and constructability. Let’s begin with the dreaded acronym. GRS-IBS stands for Geosynthetic Reinforced Soil Integrated Bridge System. GRS is built by alternating layers of engineered backfill with sheets of geosynthetic reinforcement – essentially a gravel burrito wrapped with fabric. The U.S. Forest Service first used gravity walls in the 1970s to stabilize logging road embankments. Although GRS has been used in only the last few decades, the concept of reinforcing soil with organic materials has been around for thousands of years, dating back to straw and mud dwellings. GRS-IBS accelerates bridge construction time, reduces cost and is less sensitive to weather conditions during construction compared to other bridge types. The design is flexible and easily modified in the field.

GRS-IBS was chosen as the replacement option in this case because it provides a greater capacity to pass flood flows, allows for a natural stream channel underneath the structure, and is much simpler and cheaper to build than a traditional bridge. In fact, some county transportation agencies have spanned streams with smaller, single-span bridges and realized a 40% cost savings over conventional construction. The new bridge was designed to safely pass the 100-year flood event. It spans 19’ and raises the existing road bed by 5.5 feet, providing more than four times the capacity of the old culverts. J-U-B Engineers in Coeur d’Alene completed the bridge design with Tribal staff providing permitting and hydraulic design support.

The greatest amount of time during construction was spent preparing the new foundation for the bridge. Once the old, rusty culverts were removed, a large trench measuring 60’x30’x13’ deep was dug to span both sides of the creek and then backfilled with a one foot deep

layer of crushed, compacted rock. Concrete ecology blocks were then placed one by one in an interlocking configuration to form a perimeter of retaining walls. The reinforced layers of gravel were then built up, layer by layer, within the walls formed by the blocks. Woven geotextile fabric was placed between each “lift” to add strength to the foundation. These walls were constructed starting at 12 feet below the elevation of the bridge deck in order to provide for scour protection against large floods. Steel bridge beams were provided by the Worley Highway District and were 2 feet tall. A concrete pad was poured over the top of the foundation walls to set the beams on. Lying between this concrete and the beams were sets of neoprene bearing pads and a steel plate. The steel plates were anchored to the concrete with a bolt and were welded to the base of the beams to hold them in place. The bridge decking consisted of galvanized steel bridge planking welded to the beams. Old road signs were creatively used to form a barrier between the beams and the gravel road bed. The new stream bed was created using small rock to form a meandering stream channel underneath the bridge. This rock will also help protect the new footings against scour. The road was re-graded and additional ditch relief culverts were placed on the site to help divert water from the road before it reaches the new bridge. Six inches of gravel were placed on the metal bridge decking to form the road base on top of the bridge. Guard rails were installed as a safety measure.

A major challenge in completing this project was dewatering the site. Before other work started a temporary bypass channel was dug to pass the stream around the construction area. This worked amazingly well to ensure no sediment entered the stream during construction, however, supplemental pumps had to be used frequently because a large amount of groundwater would slowly seep into the open trench each day. Pumping also had to be done over the weekends in order to keep the site dry. Another challenge was in placing the bridge beams onto the concrete pads. Getting them in place in the correct position was difficult since the bridge span almost exceeded the reach of the excavator that was on site. Everyone was impressed with how well the soil lifts worked in creating a stable foundation for the new bridge and the project was handily completed with a crew that had no previous experience with this construction technique.

This was the second bridge construction project for the Fisheries Program and the fifth stream crossing that has been replaced by the Tribe in the Lake Creek watershed as part of an effort to improve fish passage following a 2008 Road Condition Survey that highlighted problem areas. This project provides full fish passage for 4.26 miles of high quality habitat upstream of the stream crossing.

This was a great collaboration between the Tribe and the Worley Highway District with both parties contributing staff, equipment and their own unique

expertise to make it happen. Every stage of the project was accomplished with the Tribe and the District working together. The project was started in late September and anticipated to be finalized in early November. We would like to thank the adjacent landowners, the Ruark family, for letting us use their property for construction access.



The new bridge over Bozard Creek nears completion in late October



Stream restoration programs in the spotlight at St. Maries workshop

By Steve Stuebner

This is a condensed version of an article originally published by the Idaho Soil & Water Conservation Commission.

People that live near the many streams and waterways in our area play an important role in how the natural environment functions for the benefit of all. As you watch the creek flow by, maybe you'd like to learn more about it. How clear is the water? What is the water quality like? Does it have turbidity issues? Does it have eroding streambanks? Is it carrying sediment? Or, maybe you'd like to increase the potential for fish and other aquatic creatures to thrive in the stream.

University of Idaho extension educators from North Idaho put on a one-day workshop recently on "Restoring Idaho Streams" in St. Maries to share information with landowners, agency officials and students about how to assess stream health, how to identify methods for restoring streams and how to finance the restoration work.

"Streams are important to landowners," says Chris Schnepf, a University of Idaho Extension Educator

based in Kootenai County. "There's two parallel issues – many landowners want to do right by their stream, they want to take care of it. And secondly, there could be issues affecting their stream banks, water quality, or they could be even losing their property because of streambank erosion. We've seen instances where people are losing one to two feet of stream bank each year."

Schnepf organized an excellent slate of experts to share information about restoring streams at the workshop, including Jim Ekins, a UI Extension water educator who covered the basic principles of assessing and improving stream health, Bill Lillibridge, an engineer for the Idaho Soil and Water Conservation Commission who talked about a range of low- and high-cost tools for restoring streams, and Ree Brannon, District Conservationist for NRCS in St. Maries, who covered the different ways NRCS can finance stream-improvement projects and provided some detailed examples of restoration work.

In the afternoon, workshop participants learned about stream-restoration activities that the Coeur d'Alene Tribe has been working on for 15 years on Benewah Creek by taking a field trip to several restoration sites along the creek. "The work that the tribe has been doing on Benewah Creek is really wonderful," Schnepf said.

By the time the workshop was over, the speakers had inspired the participants to consider getting involved in monitoring or assessing stream health (69% expect to do that), and more than half of them said they plan to get involved in working to improve the health of their streams and more than half said they plan to seek professional assistance in enhancing stream health.

"Most of our participants were forest landowners with an average of about 130 acres of land, so this was good news," said Jim Ekins. "We feel like they learned a lot, based on their feedback, and hopefully they're excited about taking the next steps to improve their streams."

One of the more interesting aspects of the workshop: Participants learned that stream-restoration work can vary considerably depending on project objectives, budget and engineering. For example, Brannon and Lillibridge presented information about different ways to stabilize streambanks, ranging from low-cost techniques such as planting willows, to more robust and expensive techniques such as using a mix of rip rap and vegetation planting, while using heavy equipment to create a sustainable slope for a streambank.

In the field trip to Benewah Creek, Coeur d'Alene Tribe officials showed how they have been restoring Benewah Creek using multiple methods that involved creating more meanders in the main-stem stream course and deeper pools to decrease stream temperature for native westslope cutthroat trout. All of that work actually slows the stream down, which also helps relieve the impact of water velocity on the streambanks. As a result, the restoration work focused

more on the stream course, and slowing down velocity, versus streambank stabilization per se.

That's because their primary objectives had to do with improving stream health for fish. One way to do that was to create deeper pools in the stream, where fish could hide out in cooler water. "The tribe has goals for improving fishable populations of westslope cutthroat trout in the whole watershed," says Angelo Vitale, fisheries manager for the Coeur d'Alene Tribe. "We're seeing a lot of positive results."

In Phase 1 of the project, the tribe built 2,523 meters of new stream channel, increasing channel length by 506 meters, and reduced stream gradient by 58 percent, officials said. "The mainstem restoration has generally had the effect of improving rearing conditions (for fish), increasing flood frequency, raising shallow water tables and reconnecting cold-water habitats," according to a briefing paper on the restoration work.

In Phase 2 of the project, the tribe has been installing artificial wooden dams in a large meandering section of Benewah Creek in hopes of mimicking the work of beavers to spread the water out in the meadows surrounding the creek. They built 17 of the wooden dam structures. Phase 2 emulates "the ecosystem-engineering effects of beaver to restore both fish habitat and floodplain vegetation communities more rapidly than simply revegetating alone," the briefing paper says.

They've done more than 39 projects on Benewah Creek over a 15-year period, working together with large and small landowners as well as Benewah County, Vitale said. They've also worked on removing barriers between Benewah Creek and connecting tributary streams to open those areas for spawning and rearing.

High stream temperature and sediment were two issues affecting fish survival and stream health, Vitale said, noting that Benewah Creek is on the state 303(d) list for those two reasons. A Total Maximum Daily Load (TMDL) plan has been developed to address the issues, but certainly the tribe's restoration work has accelerated the recovery effort.

Fifteen years of conservation work on Benewah Creek has been decreasing stream temperatures and improving survival for native cutthroat trout, he says, but other factors are at play in Lake Coeur d'Alene that affect fish survival as well. One of those primary factors is northern pike, which grow very large in the lake and prey on the native trout.

To reduce predation by northern pike populations in the lake, the tribe is offering a reward of \$5/fish for catching pike, and it also offers larger rewards if people catch a large pike that's been tagged. The rewards are offered in the southern third of Lake Coeur d'Alene, the portion owned by the tribe. Benewah Creek flows directly into the lake in that area. Rewards for tagged fish run \$50 to \$1,000, Vitale said, adding, "We just gave out a \$1,000 reward last month."

The Coeur d'Alene Tribe's work on Benewah Creek provided an insightful demonstration of how stream dynamics and velocity work, and they relied on a similar playbook that Bill Lillibridge explained in his presentation. In an ideal world, Lillibridge encouraged workshop participants to restore streams to their natural condition as much as possible. That means slow the stream down with natural channels, natural meanders and woody debris and vegetation along the stream banks, he said.

In explaining stream hydraulics, he showed a formula for calculating stream velocity, which is Slope divided by Manning's Friction. In a natural situation, a stream will meander to decrease its bed slope until the erosion and deposition come into balance, he says. "The best-case scenario is to restore a stream to its original condition," Lillibridge said, noting that a natural stream evolved over many hundreds, if not thousands of years. Often development pressures lead to narrowing streams or channelizing them, increasing velocity, erosion and sediment.

Based on the participation and positive feedback from the more than 20 landowners in attendance, the workshop is likely to be held again in future years. For more information about the stream restoration workshop, contact Schnepf at cschnepf@uidaho.edu or call 208-446-1680.



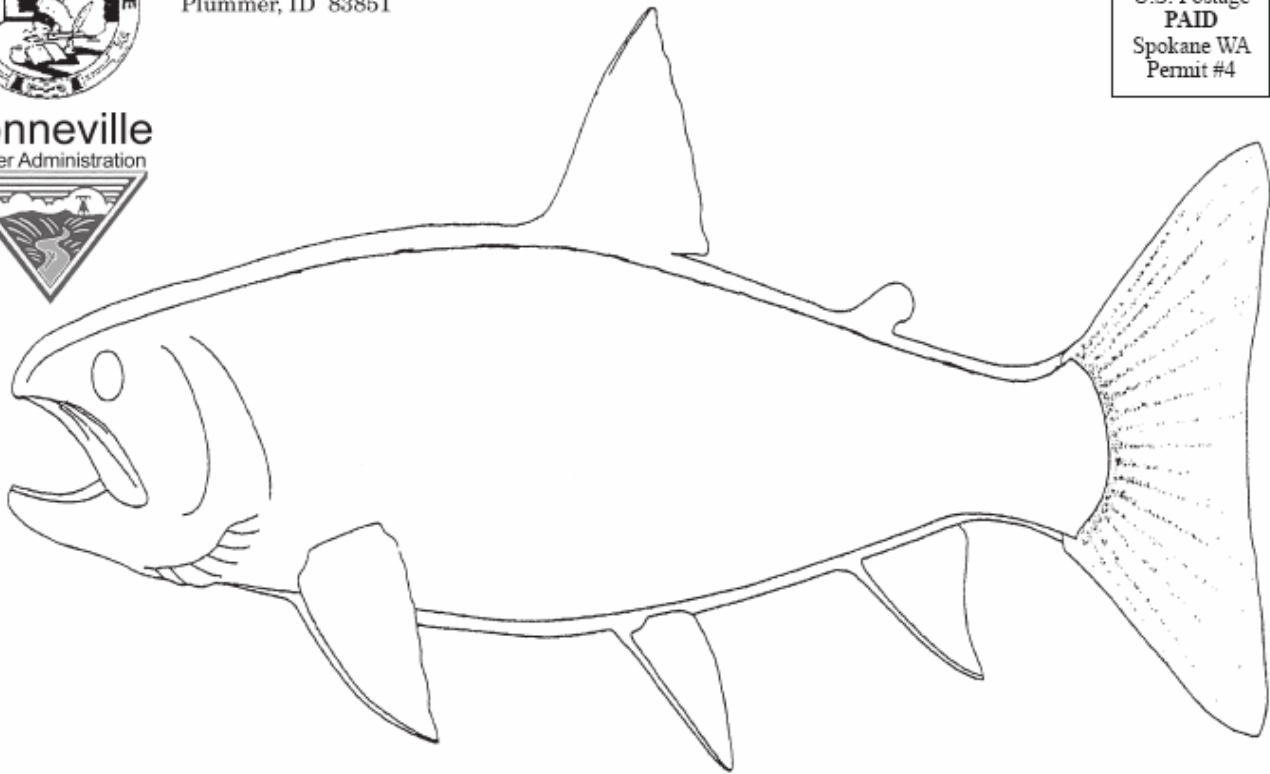
Participants in a recent workshop entitled, "Restoring Idaho Streams", listen to biologist Tom Biladeau describe work the Coeur d'Alene Tribe has undertaken in the Benewah Creek watershed.



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